

[6353]-52

T.E. (Artificial Intelligence and Data Science)
ARTIFICIAL INTELLIGENCE
(2019 Pattern) (Semester - I) (310253)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer four questions Q.1 or Q.2, Q.3 or Q.4 Q.5 or Q. 6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable data, if necessary.

Q1) a) Define Game theory,, Differentiate between stochastic and partial games with examples. [8]

b) What is Constraint satisfaction problem, State Types of consistencies Solve the following coloring problem using constraints satisfaction problem.



Variables WA, NT, Q, NSW, V, SA, T

[9]

Domains $D_i = \{\text{red, green, blue}\}$

Constraints: adjacent regions must have different colors

e.g., $WA \neq NT$

P.T.O.

OR

Q2) a) List All the strategies of problem solving. What is backtracking, explain with n queen problem with Branch and Bound or Backtracking strategy. [9]

b) How to make Optimal decision in Games, Explain Monte Carlo Tree search algorithm with all steps and one example. [8]

Q3) a) Explain Knowledge based agent with Wumpus World. [9]

b) What is Knowledge Engineering, Explain in short semantic Network with example? And Draw Semantic Network for below example [9]

Tom is Cat

Tom is Grey in Color

Tom is Mammal

Tom is owned by Sam

OR

Q4) a) Explain inference in Propositional Logic Write the following sentences in FOL (using types of quantifiers) (any 2) : [9]

i) No one has climbed every mountain in the Himalayas

ii) Someone has visited every country in the world except Libya

iii) Not all cars have carburetors

iv) Some numbers are not real

b) i) Differentiate between Propositional logic and First Order Logic. Any 4 points

ii) Explain Syntax and Semantics of FOL

[9]

Q5) a) Explain Forward Chaining and Backward Chaining.

“The law says that it is crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by colonel West, who is American”

Now prove that West is a Criminal. With forward Chaining OR Backward Chaining. [9]

b) Explain: Unification Algorithm in FOL

Solve stepwise with proper comments if $p(x, g(x))$ is equal to or not equal to $p(z, y)$. [8]

OR

Q6) a) Explain FOL inference for following Quantifiers : [8]

- Universal Generalization
- Universal Instantiation
- Existential Instantiation
- Existential introduction

b) Define and Explain Ontological Engineering in details, with Definition Categories and Objects Models. [9]

Q7) a) Explain [5]

- i) Classical planning
- ii) Hierarchical planning

b) Explain with example, how planning is different from problem solving. [5]

c) Explain AI components and AI architecture. [8]

OR

Q8) a) Explain Planning in non-deterministic domain. [5]

b) Explain [8]

- i) Importance of planning
- ii) Algorithm for classical planning

c) What is AI Explain Scope of AI in all walks of Life also explain Future opportunities with AI. [5]
